

What is claimed is:

1. A method of manufacturing a ferroelectric capacitor, comprising:  
forming a lower electrode on a base;  
5 forming a ferroelectric film which includes a lead zirconate titanate niobate (PZTN) complex oxide including lead, zirconium, titanium, and niobium on the lower electrode;  
forming an upper electrode on the ferroelectric film;  
forming a protective film so as to cover the lower electrode, the ferroelectric  
10 film, and the upper electrode; and  
performing heat treatment for crystallizing the PZTN complex oxide at least after forming the protective film.
2. The method of manufacturing a ferroelectric capacitor as defined in claim 1,  
15 wherein the PZTN complex oxide is in an amorphous state after pre-heat treatment in an oxidizing atmosphere and before the heat treatment in the step of forming the ferroelectric film.
3. The method of manufacturing a ferroelectric capacitor as defined in claim 1,  
20 wherein the protective film is a silicon oxide film and is formed by using trimethylsilane.
4. The method of manufacturing a ferroelectric capacitor as defined in claim 1,  
wherein the heat treatment for crystallizing the PZTN complex oxide is  
25 performed in a non-oxidizing atmosphere.
5. A ferroelectric capacitor formed by the method as defined in claim 1.

6. A ferroelectric memory comprising the ferroelectric capacitor as defined in claim 5.

5 7. A piezoelectric device comprising the ferroelectric capacitor as defined in claim 5.